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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/817,128	04/02/2004	John M. Cioffi	0101-p03	1512

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EXAMINER
SHARON, AYAL I

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 10/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/817,128	CIOFFI ET AL.
	Examiner	Art Unit	
	Ayal I. Sharon	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>02 April 2004</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-31</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-31</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>02 April 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-SB/08)
    Paper No(s)/Mail Date <u>10/6/05, 1/13/05</u>.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____ .

DETAILED ACTION

Introduction

1. Claims 1-31 of U.S. Application 10/817,128 filed on 04/02/2004 are currently

    pending.

2. The application claims benefit of U.S. Provisional Application 60/527,853 filed on

    12/07/2003.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

    Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
    matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
    conditions and requirements of this title.

4. **Claims 1-8, 21, and 28-31 are rejected under 35 U.S.C. 101 because the**

    claimed invention is directed to non-statutory subject matter.

5. The claims in the instant application are directed to an abstract idea. One may

    not patent every "substantial practical application" of an idea, law of nature or

    natural phenomena because such a patent "in practical effect be a patent on the

    [idea, law of nature or natural phenomena] itself." Gottschalk v. Benson, 409 U.S.

    63, 71-72, 175 USPQ 673, 676 (1972).

6. The instant claims also lack a concrete, useful, and tangible result.

7. The fundamental test for patent eligibility is to determine whether the claimed

    invention produces a **"useful, concrete and tangible result."** See State Street

Bank & Trust Co. v. Signature Financial Group Inc., 149 F. 3d 1368, 47 USPQ2d

1596 (Fed. Cir. 1998) and AT&T Corp. v. Excel Communications, Inc., 172 F.3d

1352, 50 USPQ2d 1447 (Fed. Cir. 1999). In these decisions, the court found that

the claimed invention as a whole must accomplish a practical application. That is,

it must produce a "useful, concrete and tangible result."

8. See State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02. ("[T]he

transformation of data, representing discrete dollar amounts, by a machine

through a series of mathematical calculations into a final share price, constitutes

a practical application of a mathematical algorithm, formula, or calculation,

because it produces 'a useful, concrete and tangible result' – a final share price

momentarily fixed for recording and reporting purposes and even accepted and

relied upon by regulatory authorities and in subsequent trades").

9. See also AT&T, 172 F.3d at 1358, 50 USPQ2d at 1452. (Claims drawn to a long-

distance telephone billing process containing mathematical algorithms were held

patentable subject matter because the process used the algorithm to produce a

useful, concrete, tangible result - a primary inter-exchange carrier ("PIC")

indicator - without preempting other uses of the mathematical principle).

10. The Examiner respectfully submits that the rejected claims do not recite a

concrete, useful, tangible result.

11. Independent claims 1, 21, and 28 and do not produce a tangible result, nor does

the claim indicate how the result is useful. Dependent claims 2-8 inherit this

defect.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claim 30 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The claim ends with the following words: "the QLN; and". The subsequent steps are missing.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. The prior art used for these rejections is as follows:

15. Ginis et al., U.S. PG-PUB 2003/0086514. (Hereinafter "**Ginis**").

16. The claim rejections are hereby summarized for Applicant's convenience. The detailed rejections follow.

17. **Claims 1-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Ginis.**

18. In regards to Claim 1, Ginis teaches the following limitations:

> 1. A method of evaluating the configuration of a communication system, the method comprising:
> selecting a system model;

(See Ginis, especially:)

> collecting performance-characterizing data from the communication system;

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> comparing the collected data to the system model; and

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> modifying the system model.

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

19. In regards to Claim 2, Ginis teaches the following limitations:

> 2. The method of Claim 1 wherein the steps of collecting performance-characterizing data, comparing the collected data to the system model and modifying the system model are performed iteratively.

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

20. In regards to Claim 3, Ginis teaches the following limitations:

> 3. The method of Claim 1 further comprising altering the operational mode of one or more users of the communication system.

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

21. In regards to Claim 4, Ginis teaches the following limitations:

> 4. The method of Claim 1 wherein the step of selecting a system model comprises selecting a plurality of potential system models;

> *further wherein the step of modifying the system model comprises selecting a subset of the plurality of potential system models that shows the maximum likelihood of being the actual system configuration.*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

22. In regards to Claim 5, Ginis teaches the following limitations:

> *5. The method of Claim 1 wherein the performance-characterizing operational data comprises at least one of the following data types:*
> > *channel average attenuation measurements;*
> > *channel bit distributions;*
> > *channel transmit power levels;*
> > *reported current data rates;*
> > *reported maximum possible data rates;*
> > *reported error-correction-parity;*
> > *reported use of trellis codes;*
> > *measured channel insertion loss;*
> > *measured channel gain;*
> > *measured channel phase;*
> > *inferred data regarding individual users' power levels;*
> > *operational data regarding individual users' power levels;*
> > *inferred data regarding individual users' PSD levels;*
> > *operational data regarding individual users' PSD levels;*
> > *inferred data regarding individual users' code settings;*
> > *operational data regarding individual users' code settings;*
> > *inferred data regarding the parameterized shaped PSDs of potential noises;*
> > *operational data regarding the parameterized shaped PSDs of potential noises;*
> > *the frequency/tone index of highest noise change in a recent time interval;*
> > *the total number of bit-swaps occurring in a recent time interval;*
> > *the distribution of FEC errors, code violations or errored seconds violations over several successive sub-intervals of a time interval;*
> > *measured noise power variations;*
> > *measured peak-to-average power ratio;*
> > *measured channel logarithmic magnitude;*
> > *measured quiet-line noise levels;*
> > *measured active-line noise levels;*
> > *count of ATM or other protocol cells;*
> > *measured higher-level protocol-throughput;*
> > *count of retraining;*

count of failed synchronization attempts;
reported carrier mask;
reported tone-shaping parameters; or
inferred data regarding vectored or matrix channel characterization;

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

23. In regards to Claim 6, Ginis teaches the following limitations:

6. The method of Claim 1 further comprising the step of prompting data transmission in the communication system to generate performance-characterizing data for collection.

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

24. In regards to Claim 7, Ginis teaches the following limitations:

7. The method of Claim 6 wherein prompting data transmission comprises sending stimulation signals on inactive user lines or on lines not currently carrying DSL services to provide a control signal or data set;
further wherein collecting performance-characterizing data comprises at least one of the following:
measuring the effects of the stimulation signals on lines; or
measuring the effects of normal operation signals on lines.

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

25. In regards to Claim 8, Ginis teaches the following limitations:

8. The method of Claim 1 wherein the communication system is a DSL system.

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

26. In regards to Claim 9, Ginis teaches the following limitations:

9. A communication system configuration estimator comprising:
means for collecting performance-characterizing data from a communication system, wherein the collecting means is coupled to the communication system; and

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> means for estimating the configuration of the communication system based on the collected performance-characterizing data, wherein the estimating means is coupled to the collecting means.

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

27. In regards to Claim 10, Ginis teaches the following limitations:

> 10. The estimator of Claim 9 wherein the communication system is a DSL system having a network management system, a management entity and a management information base coupled thereto;
> further wherein the collecting means is coupled to at least one of the following:
>> the network management system;
>> the management entity; or
>> the management information base.

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

28. In regards to Claim 11, Ginis teaches the following limitations:

> 11. The estimator of Claim 9 wherein the collecting means is a computer and further wherein the estimating means is the computer.

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

29. In regards to Claim 12, Ginis teaches the following limitations:

> 12. The estimator of Claim 9 wherein the estimating means compares the collected data to a model representing a potential system configuration.

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

30. In regards to Claim 13, Ginis teaches the following limitations:

> *13. The estimator of Claim 12 wherein the collecting means collects performance-characterizing data on an ongoing basis; and*
> > *further wherein the estimating means is configured to modify the model to conform the model to the collected data.*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

31. In regards to Claim 14, Ginis teaches the following limitations:

> *14. The estimator of Claim 9 wherein the estimating means compares the collected data to a plurality of models of potential system configurations and selects the most likely model from the plurality of models based on the collected data.*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

32. In regards to Claim 15, Ginis teaches the following limitations:

> *15. The estimator of Claim 14 wherein the estimating means uses a maximum likelihood methodology to select the most likely model.*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

33. In regards to Claim 16, Ginis teaches the following limitations:

> *16. The estimator of Claim 9 wherein the estimator is coupled to a controller, the controller comprising means for generating and sending control signals to parts of the communication system, the control signals comprising instructions to the parts of the communication system regarding the mode of operation to be used by the parts of the communication system.*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

34. In regards to Claim 17, Ginis teaches the following limitations:

> *17. A computer program product comprising a machine readable medium on which is provided program instructions for evaluating the configuration of a communication system, the program instructions comprising:*
> > *instructions for selecting a system model;*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> instructions for collecting performance-characterizing data from the communication system

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> instructions for comparing the collected data to the system model; and

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> instructions for modifying the system model.

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

35. In regards to Claim 18, Ginis teaches the following limitations:

> *18. The computer program product of Claim 17 wherein the communication system is a DSL system.*
>
> (See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

36. In regards to Claim 19, Ginis teaches the following limitations:

> *19. A method of estimating the configuration of a DSL system, the method comprising:*
> *collecting performance-characterizing operational data from the DSL system, wherein collecting the operational data comprises receiving the operational data via element management protocols in the DSL system;*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> *identifying a plurality of potential DSL system models;*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> comparing the collected operational data to each identified potential system model in the plurality of potential system models; and

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> selecting the potential system model that most closely matches the collected operational data; and

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> setting the operating modes of users of the DSL system.

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

37. In regards to Claim 20, Ginis teaches the following limitations:

> 20. A method of estimating the configuration of a DSL system, the method comprising:
> collecting performance-characterizing operational data from the xDSL system, the performance-characterizing operational data comprising at least one of the following data types:
> channel average attenuation measurements;
> channel bit distributions;
> channel transmit power levels;
> reported current data rates;
> reported maximum possible data rates;
> reported error-correction-parity;
> reported use of trellis codes;
> measured channel insertion loss;
> measured channel gain;
> measured channel phase;
> inferred data regarding individual users' power levels;
> operational data regarding individual users' power levels;
> inferred data regarding individual users' PSD levels;
> operational data regarding individual users' PSD levels;
> inferred data regarding individual users' code settings;
> operational data regarding individual users' code settings;

> *inferred data regarding the parameterized shaped PSDs of potential noises;*
> *operational data regarding the parameterized shaped PSDs of potential*
> *noises;*
> *the frequency/tone index of highest noise change in a recent time interval;*
> *the total number of bit-swaps occurring in a recent time interval;*
> *the distribution of FEC errors, code violations or errored seconds violations over several successive sub-intervals of a time interval;*
> *measured noise power variations;*
> *measured peak-to-average power ratio;*
> *measured channel logarithmic magnitude;*
> *measured quiet-line noise levels;*
> *measured active-line noise levels;*
> *count of ATM or other protocol cells;*
> *measured higher-level protocol-throughput;*
> *count of retraining;*
> *count of failed synchronization attempts;*
> *reported carrier mask;*
> *reported tone-shaping parameters; or*
> *inferred data regarding vectored or matrix channel characterization;*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> *identifying a plurality of potential xDSL system models;*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> *evaluating the correlation between each potential system model and the collected operational data, wherein evaluating the correlation comprises at least one of the following:*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> > *comparing observed operational data, generated by user use of the xDSL system, to each identified possible system model in the plurality of system models; or*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> *comparing prompted operational data, generated by stimulating the xDSL system, to each identified possible system model in the plurality of system models; or*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> *comparing time-relative operational data, generated by creating time-relative events within the xDSL system, to each identified possible system model in the plurality of system models;*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

> *selecting one of the potential system models that most closely correlates to the operational data.*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

38. In regards to Claim 21, Ginis teaches the following limitations:

> *21. A method of evaluating the Hlog function of a line in a DSL system, the method*
> *comprising:*
> *(1) setting a data-bearing frequency carrier mask;*
> *(2) transmitting data using one or more frequencies in the carrier mask;*
> *(3) receiving an attenuation value for the transmitted data;*
> *(4) plotting the attenuation value; and*
> *(5) repeating steps (1)-(4) using one or more different carrier masks.*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

39. In regards to Claim 22, Ginis teaches the following limitations:

> *22. The method of Claim 21 wherein f is the only frequency in each carrier mask and the corresponding received attenuation value is the insertion loss of the line for f.*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

40. In regards to Claim 23, Ginis teaches the following limitations:

> *23. The method of Claim 21 wherein the data-bearing carrier mask comprises a band of frequencies having a lower bound of f and further wherein the received attenuation value is an approximation of the insertion loss of the line for f.*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

41. In regards to Claim 24, Ginis teaches the following limitations:

> *24. The method of Claim 21 further comprising:*
> *(6) approximating the channel transfer function of the entire DSL system usable frequency range on the basis of received attenuation values.*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

42. In regards to Claim 25, Ginis teaches the following limitations:

> *25. The method of Claim 24 further comprising:*
> *(7) removing undesirable effects from the approximated channel transfer function.*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

43. In regards to Claim 26, Ginis teaches the following limitations:

> *26. The method of Claim 21 further comprising:*
> *(6) determining at least one of the following values for the line:*
> > *QLN;*
> > *MSE; or*
> > *SNR.*

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

44. In regards to Claim 27, Ginis teaches the following limitations:

> *27. The method of Claim 26 further comprising:*
> *(7) setting or recommending the operational mode of part of the DSL system based on at least one of the following values for the line:*

Hlog;
QLN;
MSE; or
SNR.

(See Ginis, especially: paragraphs [0034] to [0041], [0061], [0083], and [0169] to [0172]))

Conclusion

45. The following prior art, made of record and not relied upon, is considered

pertinent to applicant's disclosure. They are all co-authored by Prof. Cioffi, one of

the co-authors in the instant application.

46. Palomar, D.P. et al. "Optimum Joint Transmit-Receive Linear Processing for

Vectored DSL Transmission with QoS Requirements." 36th Asilomar Conf. on

Signals, Systems and Computers. Nov. 3-6, 2002. Vol.1, pp.388-392.

47. Lee, Jungwon et al. "A Multi-User Rate and Power Control Algorithm for VDSL."

GLOBECOM '02. Nov. 17-21, 2002. Vol.2, pp.1264-1268.

48. Zeng, Chaohuang et al. "Crosstalk Identification in xDSL Systems." IEEE Journal

on Selected Areas in Communications. Aug. 2001. Vol.19, Issue 8, pp.1488-

1496.

49. U.S. Patent 6,990,196 to Zeng et al.

50. U.S. Patent 5,479,447 to Chow et al.

Correspondence Information

Any inquiry concerning this communication or earlier communications from

the examiner should be directed to Ayal I. Sharon whose telephone number is

(571) 272-3714. The examiner can normally be reached on Monday through

Thursday, and the first Friday of a bi-week, 8:30 am – 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the

examiner's supervisor, Paul Rodriguez can be reached at (571) 272-3753.
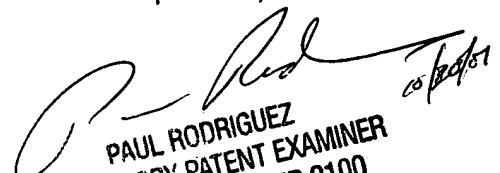
Any response to this office action should be faxed to (571) 273-8300, or

mailed to:

    USPTO
    P.O. Box 1450
    Alexandria, VA 22313-1450

or hand carried to:

    USPTO
    Customer Service Window
    Randolph Building
    401 Dulany Street
    Alexandria, VA 22314

Any inquiry of a general nature or relating to the status of this application

or proceeding should be directed to the Tech Center 2100 Receptionist, whose

telephone number is (571) 272-2100.

PAUL RODRIGUEZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

Ayal I. Sharon
Art Unit 2123
October 29, 2006